

# SERVICE MANUAL

**AIR DISC BRAKE ACTUATORS OBC**  
Brake Chamber Diaphragm Actuators



**TRUCKSERVICES**



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**Note:** If service work is carried out on a vehicle based on information provided herein, it is the responsibility of the workshop to ensure the vehicle is fully tested and in full functional order before the vehicle is returned into service. Knorr-Bremse accepts no liability for problems caused as a result of appropriate tests not being carried out.

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### Revision Details

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## Safety and Environmental Guidelines for Knorr-Bremse Commercial Vehicle Systems products

### Note:

The safety advice listed below is applicable to general service and diagnostic work on braking systems. Also observe any recommendations from the axle or vehicle manufacturer concerning towing, jacking-up and securing the vehicle.

### Caution!

Knorr-Bremse is not liable for any costs and damage caused by improper installation and use of Knorr-Bremse aftermarket products, in particular in the event of (i) use in non-approved applications and/or use in non-compliance with the technical specifications and installation instructions, (ii) incorrect installation or removal of Knorr-Bremse aftermarket products and (iii) failure to observe instructions on the use of tools.

**In addition to product-specific installation and hazard warnings, the following precautions and additional hazard warnings must be observed before and during work on and around compressed air systems:**

1. Always wear safety glasses when working with air pressure.
2. Never exceed the vehicle manufacturer's recommended air pressures.
3. Never look into air jets or direct them at anyone.
4. Never connect or disconnect a hose or line containing pressure; it may whip as air escapes.
5. When removing or servicing a product, ensure all pressure related to the specific system it is contained in has been depleted to 0 bar. Be aware that if the vehicle is equipped with an air dryer system, it can also contain air pressure along with its purge reservoir, if fitted, even after pressure has been drained from the other reservoirs.
6. If it is necessary to drain the air pressure from reservoirs, etc., keep away from brake actuator push rods and levers since they may move as system pressure drops. On vehicles fitted with air suspension, it is advised when undertaking such work, to support the chassis from sudden lowering and therefore prevent any possibility of being trapped between the chassis and axle or ground.
7. Park the vehicle on a level surface, apply the parking brakes, and always chock the wheels as depleting vehicle air system pressure may cause the vehicle to roll.
8. When working under or around the vehicle, and particularly when working in the engine compartment, the engine should be shut off and the ignition key removed. Where circumstances require that the engine be running, **EXTREME CAUTION** should be taken to prevent personal injury resulting from contact with moving, rotating, leaking, heated or electrically charged components. Additionally, it is advisable to place a clear sign on or near the steering wheel advising that there is **WORK IN PROGRESS ON THE VEHICLE**.
9. When working on vehicles equipped with air suspension, to guard against injury due to unexpected downward movement of the chassis caused by sudden pressure loss in the suspension system, ensure that the vehicle chassis is mechanically supported with a 'prop' between the chassis and the axle or between the chassis and the ground.
10. Examine all pipework for signs of kinks, dents, abrasion, drying out or overheating. Be aware that kinks in pipework may result in air pressure being trapped in the pipework and associated equipment. Replacement hardware, tubing, hose, fittings, etc. must be of equivalent size, type and strength as original equipment and be designed specifically for such applications and systems. Check the attachment of all pipework; it should be installed so that it cannot abrade or be subjected to excessive heat. Only use tools specially designed for cutting pipes in order to prevent incorrect cutting and, in particular, to avoid shavings remaining in the pipes or other impurities which may later lead to leaking connections and subsequent malfunctions of the system.
11. Components with stripped threads or damaged/corroded parts must be replaced completely. Do not attempt repairs requiring machining or welding unless specifically stated and approved by the vehicle or component manufacturer.
12. Never attempt to install, remove, disassemble or assemble a device until you have read and thoroughly understood the recommended procedures. Some units contain powerful springs and injury can result if not properly dismantled and reassembled. Use only the correct tools and observe all precautions pertaining to use of those tools.
13. Before removing any device note its position and the connections of all pipework so that the replacement/serviced device can be properly installed. Ensure that adequate support or assistance is provided for the removal/installation of heavy items.
14. We highly recommend to use only genuine replacement parts, components, and kits as supplied by Knorr-Bremse or the vehicle manufacturer containing original Knorr-Bremse parts. Knorr-Bremse will not be liable for any issues arising from the usage of non-Knorr-Bremse products. Only use the recommended tools as specified in related Knorr-Bremse instructions.

15. The serviced or replaced product must be checked for correct function and effectiveness.
16. If products have been dismantled, serviced or replaced, whose performance could affect braking performance or system behaviour, this should be checked on a roller dynamometer. Bear in mind that a lower performance may be experienced during the bedding-in phase if new brake pads/linings and/or brake discs/drums have been fitted.
17. The use of impact screwdrivers or impact wrenches in conjunction with Knorr-Bremse service tools for air disc brakes is not permitted. The service tools are not designed for such use. It is likely that the tools or the vehicle will be damaged and there is a serious risk of injury – see Caution on previous page.
18. Do not use compressed air to clean the disc brake. Avoid air contamination of brake dust.
19. Prior to returning the vehicle to service, make certain that all components and the complete brake systems are leak free and restored to their proper operating condition.
20. During service work on vehicles with electronic parking brake, service or parking brake, or bus stop temporary hold brake, the brake system must be set to service and maintenance mode. Please also observe the instructions of the vehicle manufacturer.

## Welding

To avoid damage to electronic components when carrying out electrical welding, the following precautions should be observed:

1. In all cases, before starting any electrical welding, remove all connections from any electronic control units or modules, noting their position and the order in which they are removed.
2. When re-inserting the electrical connectors (in reverse order) it is essential that they are fitted to their correct assigned position - if necessary this must be checked by PC Diagnostics.

## Disposal of Waste Equipment by Business Users in the European Union



This symbol on the product, packaging or in user instructions, indicates that this product must not be disposed of with other general waste. Instead, it is your responsibility to dispose of the waste electrical and electronic parts of this product by handing them over to a company or organisation authorised for the recycling of waste electrical and electronic equipment. For more information about arrangements for waste equipment disposal please contact your Knorr-Bremse distributor or local Knorr-Bremse representative.





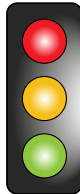
# 1. General Informations

## 1.1. General Informations

### Reference documentation

C16352	– Service Manual for SB6 / SB7 Air Disc Brakes
Y006471	– Service Manual for SN6 / SN7 / SK7 Air Disc Brakes
Y081564	– Service Manual for SL7, SM7 Air Disc Brakes
Y015044	– Service Manual for SN5 Air Disc Brakes
Y173241	– Service Manual for ST7 Air Disc Brakes
Y418754	– Service Manual for NexTT Air Disc Brakes
Y193970	– TruckServices Actuator Maintenance Gauge (Product Video)
Y194318	– TruckServices Actuator Maintenance Gauge (Service Instructions)
Y302415	– TruckServices Actuator Maintenance Gauge (Service Instructions)

### Industrial terms for parking condition

Foot brake pedal	Hand brake valve lever	Brake Chamber Actuator	Air Disc Brakes	Vehicle Condition
				
Not applied	Emergency	Activated	Activated	Parking
Not applied	Not applied / "run"	Delivery or driving	Released	Driving

### Spare Parts List

Knorr-Bremse PN	Description
II36860	Mounting Kit (2 hexagonal Self-locking Nuts)

#### Note:

The Mounting Kit can be used on all OBC (BS2..., BS3..., BS45..) Spring brakes Actuators.

### Assembly grease

II14525 – Fuchs Renolit HLT2 according to N12006-1.1

### Service Tool

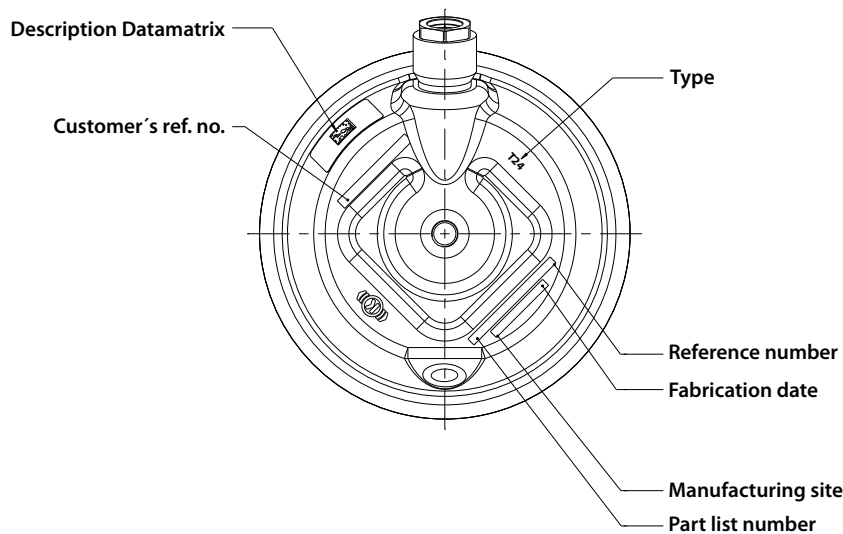
K108806K50 – Actuator Maintenance gauge

**Torque requirements**

Thread size	Description	Tightening torque [Nm]	A/W Spanner size [mm]
M16x1.5	Mounting Nuts	180 <sup>+30</sup>	24
M12x1.5	Air connector fittings	NAv	Typ 18
M16x1.5		40 <sup>+5</sup>	24
3/8-NPTF-1		40 <sup>+5</sup>	TBD
M22x1.5		70 <sup>±10</sup>	Typ 34
M22x1.5 N10164-NG12		max. 60	24
VOSS 230		14 <sup>+3</sup> (Plug)	24 (Plug)
VOSS 232		14 <sup>+3</sup> (Plug)	24 (Plug)

**1.2. Product Identification and marking**

**1.2.1 Engraving on the product**



**1.2.2 DMC (Data Matrix Code)**

The purpose of the introduction on the KB products in quick handling and data storing during the production and post production process like transport and shipment or warehousing to the final customer until the product is assembled.



**Example of DMC location**

Dimensions  
Adhesive label 38x25 mm, DMC 18x18



# 1 General Informations

## 1.3. Important Safety

Before working on or around Air braking systems and devices, the following precautions should be observed:

- Stop the engine before working under a vehicle.
- Always chock the wheels because depleting vehicle Air system pressure may cause the vehicle to roll. Keep hands away from Brake Chamber Actuator pusher or push rods; they may apply as system pressure drops.
- Never connect or disconnect an Air hose or line containing Air pressure, it may whip as Air escapes. Never remove a device or pipe plug unless you are sure that all system Air pressure has been depleted.
- Never exceed recommended Air pressure and always wear safety glasses when working with Air pressure. Never look into Air jets or direct them at anyone.
- Never attempt to dismantle a device until you have read and understood recommended procedures. Some units contain powerful springs and injury can result if not properly dismantled. Use only correct tools and observe all precautions relative to the use of these tools.

## 1.4. Note

- Use only genuine Knorr-Bremse parts and it is recommended to replace Brake Chamber Actuators always as an axle set.
- For safety reasons, when fitting a new Brake Chamber Actuator, remove connection(s) from old Brake Chamber Actuator and disassemble and discard old male fitting(s); the fir-tree plug(s) should be left installed in the Air pipe(s).
- Always use only new mounting Nuts (for reference Knorr-Bremse Mounting kit PN: II36860) for the installation of the Brake Chamber Actuator. Tightening torque is in the range of: **180 +30 Nm**.
- After installation of the replacement Brake Chamber Actuator, ensure that the non pressure plate breather hole at the lowest point is unplugged. All other breather holes can be plugged or remain unplugged as in the Knorr-Bremse delivery condition.
- Please also refer to section Safety and Environment Guidelines on the Page 4 and 5 of this document, and other relevant safety instructions for repair work on commercial vehicles, especially for jacking up and securing the vehicle.

### **ATTENTION!**

The Knorr-Bremse Roman numerals I or II at the beginning of some old part numbers should not be read as 1 or 11.

### **Test preliminaries:**

Before you begin testing the Air braking system, perform the following checks:

- Examine all pipework for signs of kinks, dents, abrasion, drying out or overheating.
- Check attachment of all pipework; it should be supported so that it cannot abrade or be subjected to excessive heat.



## 2. Product Features

Through Knorr-Bremse continuous improvement process from 2004 a design change was phased in to improve the Service portion of the Brake chamber Actuators. Due to that the latest mono block crimped OBC design has the following benefits:

- All Parts are manufactured to the exact specifications as of the OE supplied Brake Chamber Actuators.
- Incorporates Knorr-Bremse all latest design and quality features.

### 2.1. OBC

- Basic product naming stands for continues development on crimped Optimized Brake Chamber (OBC) technology by Knorr-Bremse Engineering.
- Reduce number of variants for the Aftermarket and replacement parts.
- Original or genuine replacement Brake Chamber Actuator includes all latest modifications such as non-clamp ring technology.
- Provides a quick and cost-effective option to the original Brake Chamber Actuator servicing without additional manipulation or assembly equipment needs.
- Each Knorr-Bremse rationalized crimped OBC Brake Chamber Actuator is TÜV and KBA approved.

## 3. Service Intervals

### 3.1. Introduction

The service interval is the length of time from the vehicle first entering service, or from the last service, until the point in time - or distance travelled by the vehicle (whichever is the earlier) - when it is recommended that the specified braking system device is serviced using a genuine Knorr-Bremse service kit or replaced with a new part, or in the case of ABS subjected to a system functionality check.

This service interval is provided for preventative maintenance purposes so as to minimize the probability of a vehicle breakdown.

The service interval does not preclude the intermediate testing of the device on the vehicle to ensure that it is functioning in a correct manner, or the correct maintenance of other devices in the system that may influence the service interval.

The service interval can also be influenced by the positioning of the device on the vehicle, and the following service intervals are based on the assumption that each device is positioned such it cannot be inadvertently abused or that external rubber boots/seals are not exposed to abnormal influences.

In addition to legally required periodic vehicle inspections, it is recommended that simple routine inspections of a general nature are carried out to maintain the braking system at a high level of functionality.

### 3.2. Definition

These simple routine inspections, including a visual check of the Brake Chamber Actuator to verify that there is no damage or unexpected wear, should be:

- 1) the weekly checking for excess water in the reservoirs by operation of the reservoir drain valves and
- 2) the **6 monthly / (50,000 km)** checking of the complete braking system for excessive Air leakage during a maximum pressure foot brake application with the vehicle stationary and the parking brake released.

This inspection has to be done especially for vehicles which are used in severe environments (very high or low temperatures, high humidity, presence of aggressive substances or fluids ...) or submitted to frequent braking (buses or coaches, garbage trucks, urban distribution ...)

These inspections are carried out as preventive maintenance so as to minimize the possibility of a vehicle breakdown. The service interval can also be influenced by the positioning of the device on the vehicle and the service intervals are based on the assumption that each device is positioned such it cannot be inadvertently abused or that external rubber boots / seals are not exposed to abnormal influences.

### 3.3. Spare Parts

The Brake Chamber Actuator **MUST** be serviced by using the genuine Knorr-Bremse Service Kit or part.

In general Knorr-Bremse Service Kits contain all of the components that can deteriorate with use, such as rubber parts (O-rings, special seals, bonded inlet / exhaust valves, exhaust flaps ...), plastic and metal parts (filter elements, springs ...), fasteners and the correct grease.

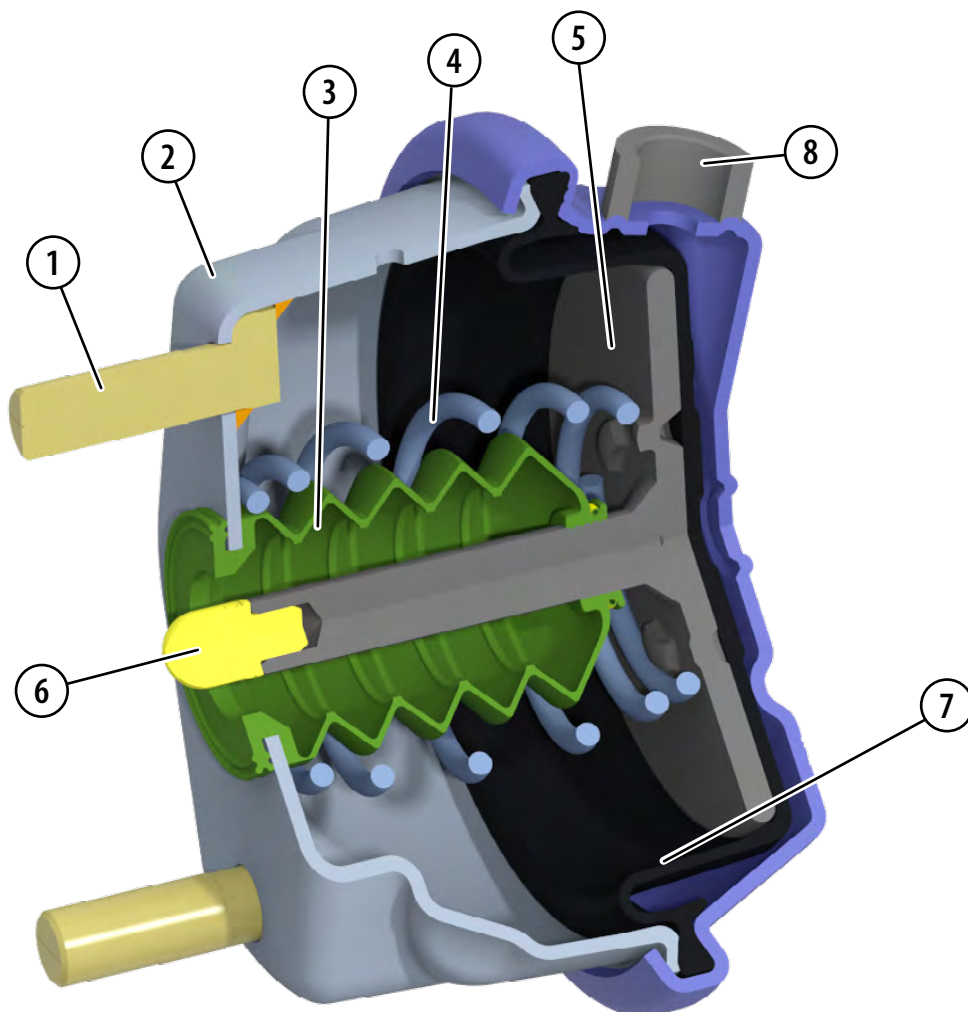
The range of Service Kits is designed to enable each device to be serviced in part or completely. Knorr-Bremse Service Kits are only designed for use with genuine Knorr-Bremse assemblies and are only to be used in the manner detailed in these service instructions.

After servicing, the assembly must also be checked in accordance with vehicle manufacturer's instructions to ensure correct operation before the vehicle is placed back in service.

## 4. Basic Principles

### 4.1. Cross Section View and List of Components

Pos	Description
1	Mounting stud
2	Non-pressure plate (NPP)
3	Bellows
4	Return spring
5	Front piston
6	Pusher
7	Service diaphragm
8	Air Port



## 4 Basic Principles

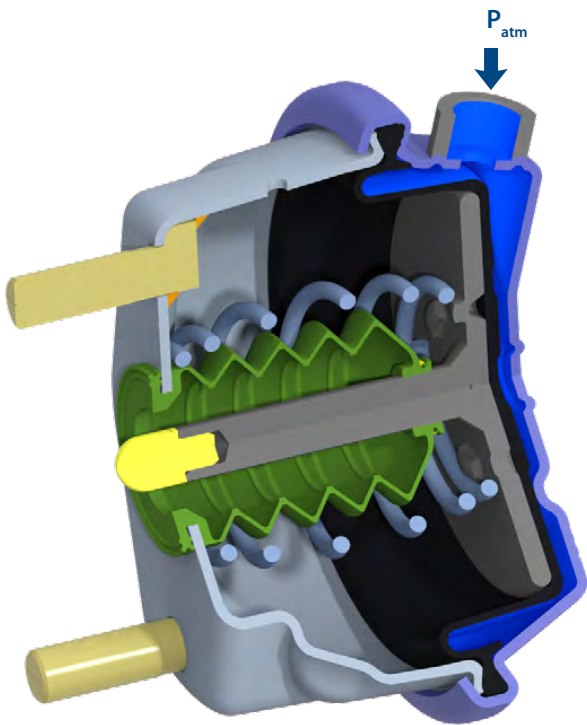
### 4.2. Application

The Brake Chamber Actuator is used for generating the input force required for the service brake of the ADB Caliper.

### 4.3. Functional Descriptions

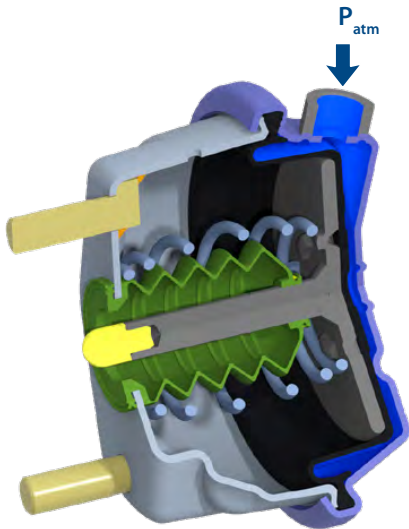
#### 4.3.1. Delivery condition

In delivery condition, the return spring keeps the service piston at zero stroke.



**4.3.3. Driving condition**

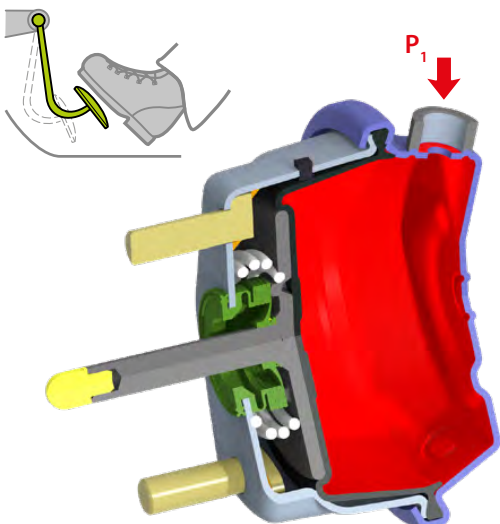
In driving position, the Air connection Port is vented to atmosphere, service brake chamber is not pressurized. Front piston and Service diaphragm are held backwards in the 'service brakes released' condition by the Return spring.



**4.3.4. Service brake position (Braking with the Foot brake pedal or emergency braking via Hand brake lever)**

When Air pressure supplied through Air connection Port is introduced into service chamber the Service diaphragm moves the Front piston outwards with a force proportional to its effective area and the Air pressure value applied. The Pusher transfers this force to the ADB via the lever of the ADB Caliper, thus the service brake is activated. When the pressure is reduced or removed, the Return spring moves the Front piston and the Service diaphragm backwards to the 'service brake released' condition. As the Service diaphragm moves forward, any water or other contamination is expelled through the vent drain hole. This also allows for equalization of any pressure between non-pressure plate and atmosphere caused by Air displaced by the Service diaphragm.

**Service Brake**



## 5. Installation of the Brake Chamber Actuator to the vehicle



Go to the Product Search section of the website [truckservices.knorr-bremse.com](https://truckservices.knorr-bremse.com) to select the correct Brake Chamber Actuator part number or type number.

### 5.1. General product precaution

In assembled position, there must be no risks of damage of the Brake Chamber Actuator by any external element (friction, shocks, chemical substances, etc.).

Brake Chamber Actuators before mounting on the ADB Calliper must be stored in a dry, clean place, at normal conditions regarding temperature and pressure, sheltered from sun, ultraviolet and chemical substances.

The Brake Chamber Actuator must be handled with care. The product must not drop down and must not have any mark caused by a shock.

If any abnormality on the Brake Chamber Actuator (non-conform aspect, damage, strange behaviour that cannot be controlled with a test bench, ...) is noticed, the Brake Chamber Actuator cannot be used.

**Note:**

Before starting work on the vehicle interface please refer to the Safety Guidelines on Page 4 and 5.

**Important Note:**

The Brake Chamber Actuator must not be disassembled for safety reasons as it is not possible to assemble crimped mono block design again.

### 5.2. ADB caliper preparation for the Brake Chamber Actuator assembly

Prepare the ADB Caliper Interface for assembly of the Brake Chamber Actuator according to the Service Manual C16352 (for SB6 / SB7 Air Disc Brakes), Y006471 (for SN6 / SN7 / SK7 Air Disc Brakes), Y081564 (for SL7, SM7 Air Disc Brakes), Y015044 (for SN5 Air Disc Brakes) or Y173241 (for ST7 Air Disc Brakes) or Y418754 (for NexTT Air Disc Brakes).

Check that the ADB Caliper mounting surface is not cracked or damaged and is clean.

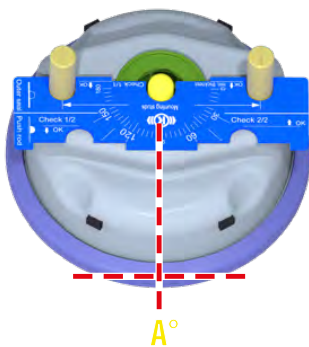
## 5.3. Preparation of the replacement Brake Chamber Actuator before the installation

Make a final check that the replacement genuine Brake Chamber Actuator matches the original in respect of Air connection Port's angle and push rod length.

### 5.3.1. Usage of the Knorr-Bremse Maintenance Gauge Service Tool K108806K50

#### 5.3.1.1. Air connection Port(s) orientation

Measure the angle (A) of the ports on the Intermediate flange relative to the Mounting studs.



For help in usage of the Knorr-Bremse Maintenance Gauge see the animation Y193970 on the website: [truckservices.knorr-bremse.com](http://truckservices.knorr-bremse.com) under Download Software then Animations. Other document's refer Page 6.

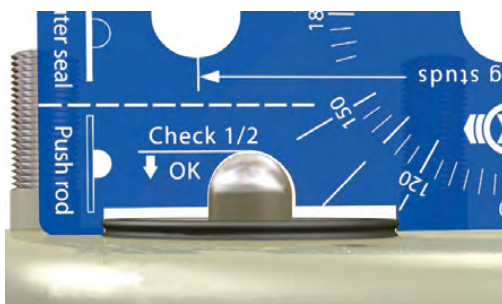
#### 5.3.1.2. Quad-ring seal

Check that the quad-ring seal is correctly located in the Non-pressure plate (NPP) by using the Knorr-Bremse Maintenance Gauge to check the seal height.



#### 5.3.1.3. Push rod protrusion

Check that the front piston is correctly located in the diaphragm by using the Knorr-Bremse Maintenance Gauge to check the push rod protrusion.





## 5 Installation of the Brake Chamber Actuator to the vehicle

### 5.4. Assembly and merge of Brake Chamber Actuator together with ADB caliper

Move the Hand brake valve lever to the “run” position (ADB brakes are released).



Before mounting the Brake Chamber Actuator on the ADB Caliper, the front Mounting flange surface (in contact with the ADB Caliper) must be inspected and cleaned.

#### Mounting flange



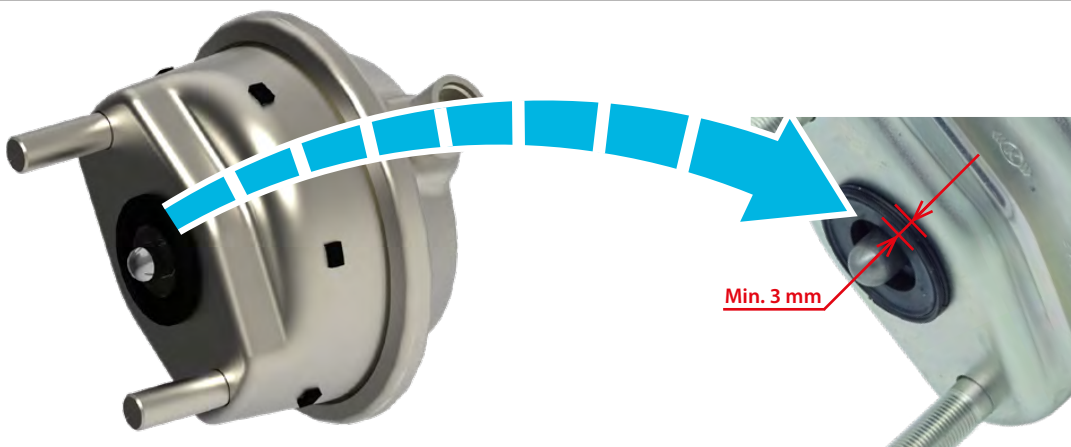
Assemble the genuine new Brake Chamber Actuator on the ADB caliper. Always respect the orientations of the Air connection Ports.

Grease according to ADB Service manual must be present between the pusher and the lever of the ADB Caliper.

If the Brake Chamber Actuator is supplied with a rubber bellows which should now be fitted, ensure correct location in the surrounding ADB Caliper mounting face hole.

#### **CAUTION!**

Do not use Brake Chamber Actuator with Bellows sealing interface thickness less than **3 mm**.



# Installation of the Brake Chamber Actuator to the vehicle 5

Manually fit 2 new and unused M16x1.5 Self-locking Nuts (parts included in the Knorr-Bremse Mounting kit PN I136860) and tighten alternatively in line with recommended following procedure:

- Apply a pre-torque of 120 Nm on Nut #1 and Nut #2
- Apply a final torque Nut #1 and Nut #2, see chart:

## Final torque

Self-locking Nuts (EN ISO 10513)	200 <sup>+10/-20</sup> Nm
Alternative(Standard Nuts & Washer)	180 <sup>+30</sup> Nm

### Important Note:

Washers are not supplied by Knorr-Bremse. In case you decide to use Nut and Washers, they must be fitted between the Mounting nuts and the ADB Caliper - never between the Brake Chamber Actuator NPP and the ADB Caliper.

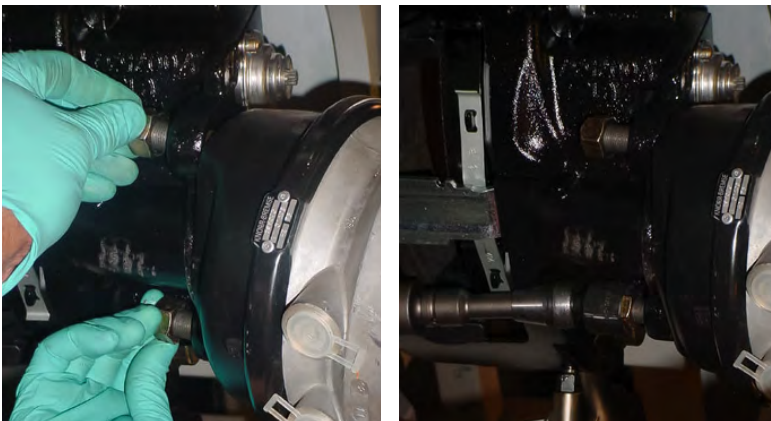
### Note:

Do not re-use the old Nuts – interface to ADB Caliper is safety feature.

The use of an electric torque gun (Nut runner) to tighten the Nuts is recommended.



Do not use an impact wrench.



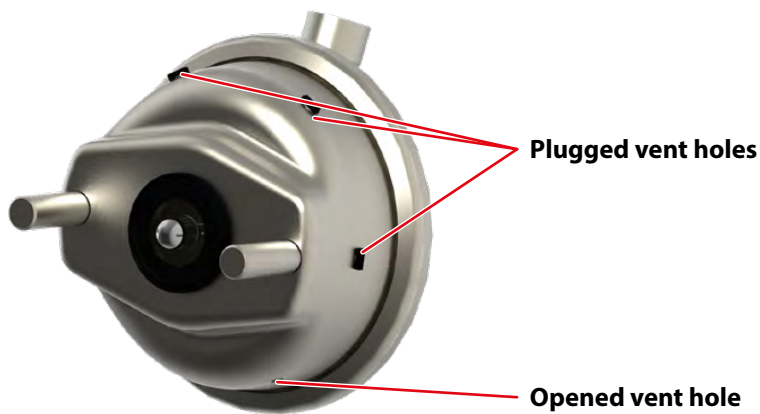
### Note:

Nut#1 is the one which is in higher position or less accessible from the operator who assembles the actuator.

## 5 Installation of the Brake Chamber Actuator to the vehicle

### 5.4.2. Service portion vent drain (breathing) hole(s)

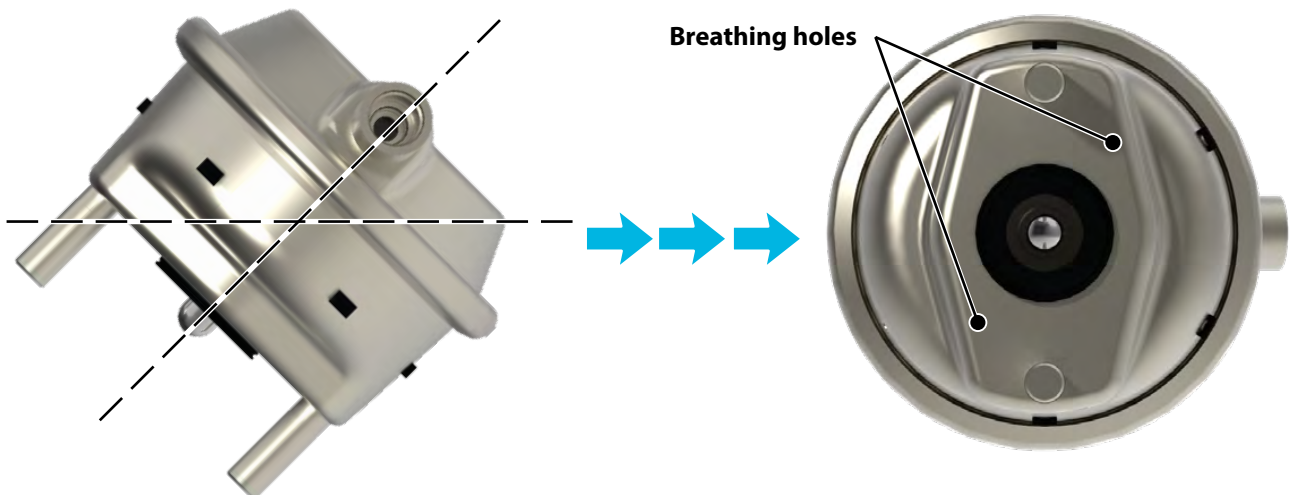
After installation of the Brake Chamber Actuator on the vehicle make sure that there is an open vent drain hole in the service portion Non-pressure plate (NPP) of the Brake Chamber Actuator pointing towards the ground with  $\pm 30^\circ$  **MAX** tolerance.



It is recommended by Knorr-Bremse to plug any other vent holes with plugs (included in the service kits) to decrease dust and water continual ingress inside of the NPP.

**Note:**

If the final angular position between the Brake Chamber Actuator axis and the horizontal axis is superior to  $45^\circ$ , Knorr-Bremse strongly recommends using a Non-pressure plate with 2 breathing holes on the front surface of the Brake Chamber Actuator.



# Installation of the Brake Chamber Actuator to the vehicle 5

## 5.5. Port Connection to the Air Brake Circuits

All the sealing surfaces (Bellows, front surface of the non-pressure plate, Air connection Ports, ...) between the Brake Chamber Actuator and the Air brake circuits or the braking system must be undamaged and clean.

Correctly connect Air service brake hose to Air connection Port and be sure that the hoses are not twisted or in contact with moveable vehicle components.

**Note:**

If the ADB Caliper is a floating one, make sure that the Air hose length allows the full caliper / actuator travel.

Knorr-Bremse genuine Air connector fittings should be tightened as stated in the chapter 1.1 on Page 7 or on the installation drawing.

Other Air connection Port Fittings must be tightened according to value indicated by the vehicle manufacturer or in line with Service Kit producer advise.

All Connection Port Fittings has to be checked to ensure that there is no leakage during operation of the Brake Chamber Actuator.

## 5.6. Testing

### 5.6.1. Final check of the installation setup

Check of the successful installation of Brake Chamber Actuator on the ADB Caliper and vehicle interface.

**Note:**

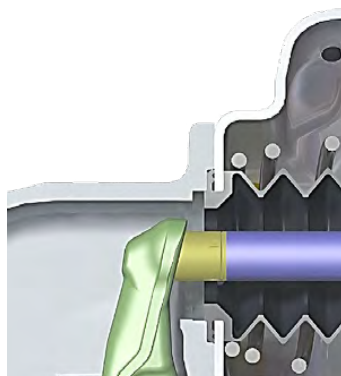
The pusher pivoting angle must not exceed  $\pm 4^\circ$  in all directions during the actuation's.

Provide the test for leakage and check the brake functionality and effectiveness before operation.

### Service portion

Apply Air pressure of approximately 10 bar 10 times to Air connection Port by using the Foot brake pedal. During these applications, check the Air tightness of the Brake Chamber Actuator in the crimping area using a leakage detection fluid or a soap solution and also check other Air supply interfaces like i.e.. Air connection Port fitting.

The matching and the tightness between the Brake Chamber Actuator and ADB Caliper are defined in the Knorr-Bremse Specification C15651 (see picture of interface cross-section)



BEFORE DRIVING THE VEHICLE, PERFORM SEVERAL APPLICATIONS OF THE SERVICE AND EMERGENCY BRAKES. REFER TO THE VEHICLE MANUFACTURER'S INSTRUCTION FOR ANY FURTHER RECOMMENDATIONS REGARDING CORRECT ADJUSTMENT OF THE BRAKES AND CHECK FOR CORRECT OPERATION.

## 6. Replacement of Brake Chamber Actuator

### 6.1. Removal of the old Brake Chamber Actuator from the Vehicle

**Note:**

Knorr-Bremse recommends replacement of Brake Chamber Actuators always in axle sets.

Ensure that Air connection Port is free of Air pressure.

Ensure vehicle wheels are chocked.

Check that the Hand brake valve lever is in the "run" position (parking brakes in "released" position).

Release the Air from Parking brakes by moving the Hand brake valve lever to the "park" position (brakes applied).

Disconnect Air pressure hoses from Air connection Ports taking careful note of which hose is connected to each port for correct reinstallation.

Cover the Air connection Ports with plugs to prevent entry of dirt or fluid inside.

Untight and remove Brake Chamber Actuator Mounting Nuts and remove Washers (if previously fitted) – Nuts and Washers cannot be re-used and has to be environmentally friendly scrapped.

Remove Brake Chamber Actuator from the common ADB Caliper interface.

# Replacement of Brake Chamber Actuator 6

## 6.2 Change from Voss 232 to Voss 230 Plug Connection System

(applicable where old actuator was fitted with Voss 230 system)

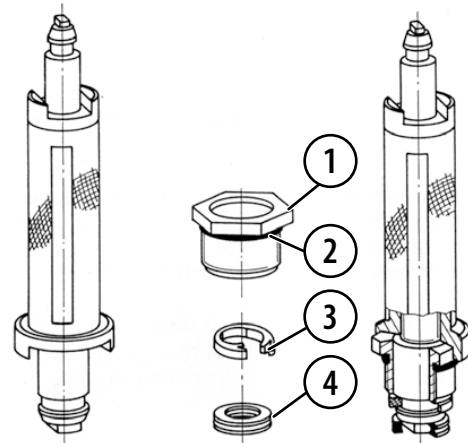
**Note:**

All instructions apply to each connection.

**Preparation**

Remove connection from old actuator and disassemble and discard old male fitting (1); the fir-tree plug should be left installed in the pipe.

Remove Voss 232 male fitting from new actuator and discard.

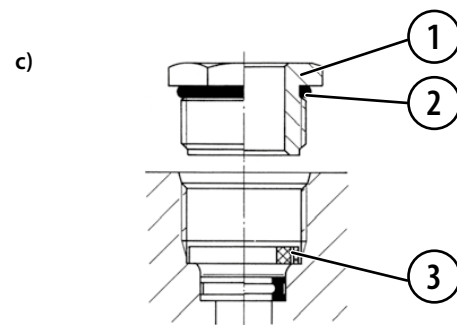
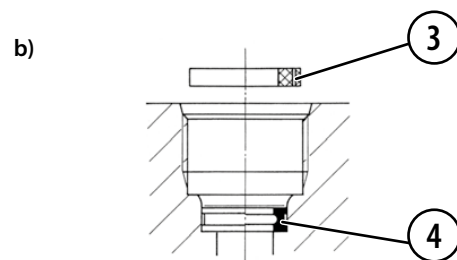
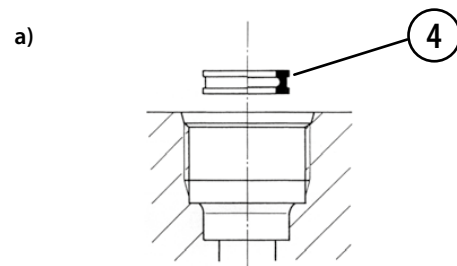


Assembly using assembly mandrel

**Assembly of fitting kit K013514 Using assembly mandrel**

The male fitting (1) with greased O-ring (2), retaining clip (3) and spring element (4) are successively mounted onto the assembly mandrel. The assembly mandrel prepared in this way is screwed hand-tight into the connection bore. The mandrel is withdrawn and the individual components remain in their position.

The male fitting (1) is then tightened fully to a torque of 14 <sup>+3</sup> Nm.



Assembly without using assembly mandrel

**Assembly of fitting kit K013514 Without using assembly mandrel**

The spring element (4) is inserted into position so that it rests flat on the counter-bore under the thread root of the connection bore – see views (a) and (b).

The retaining clip (3) is introduced so that it rests flat on the thread root – see views (b) and (c).

The male fitting (1), pre-assembled with greased O-ring (2), is then screwed by hand into the tapped bore – see view (c), then tightened fully to a torque of 14 <sup>+3</sup> Nm.

**Grease**

Use grease II14525 Fuchs “Renolit” HLT2.







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